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SEQUENCE LISTING

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Wurzburg, Beth A.

<120> MUTANTS OF IgE PROTEINS AND USES THEREOF

<130> AL-11-C1-PCT

<140> not yet assigned

<141> 2003-08-01

<150> 60/319,446

<151> 2002-08-02

<150> 10/211,948

<151> 2002-08-01

<160> 49

<170> PatentIn version 3.2

<210> 1

<211> 669

<212> DNA

<213> Homo sapiens

<220>

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cgg ccc agc ccg ttc gac ctg ttc atc cgc aag tcg ccc acg atc acc	96
Arg Pro Ser Pro Phe Asp Leu Phe Ile Arg Lys Ser Pro Thr Ile Thr	
20 25 30	

tgt ctg gtg gtg gac ctg gca ccc agc aag ggg acc gtg aac ctg acc	144
Cys Leu Val Val Asp Leu Ala Pro Ser Lys Gly Thr Val Asn Leu Thr	
35 40 45	

tgg tcc cgg gcc agt ggg aag cct gtg aac cac tcc acc aga aag gag	192
Trp Ser Arg Ala Ser Gly Lys Pro Val Asn His Ser Thr Arg Lys Glu	
50 55 60	

gag aag cag cgc aat ggc acg tta acc gtc acg tcc acc ctg ccg gtg	240
Glu Lys Gln Arg Asn Gly Thr Leu Thr Val Thr Ser Thr Leu Pro Val	
65 70 75 80	

ggc acc cga gac tgg atc gag ggg gag acc tac cag tgc agg gtg acc	288
Gly Thr Arg Asp Trp Ile Glu Gly Glu Thr Tyr Gln Cys Arg Val Thr	
85 90 95	

cac ccc cac ctg ccc agg gcc ctc atg cgg tcc acg acc aag acc agc	336
His Pro His Leu Pro Arg Ala Leu Met Arg Ser Thr Thr Lys Thr Ser	
100 105 110	

ggc ccg cgt gct gcc ccg gaa gtc tat gcg ttt gcg acg ccg gag tgg	384
Gly Pro Arg Ala Ala Pro Glu Val Tyr Ala Phe Ala Thr Pro Glu Trp	
115 120 125	

ccg ggg agc cgg gac aag cgc acc ctc gcc tgc ctg atc cag aac ttc 432
 Pro Gly Ser Arg Asp Lys Arg Thr Leu Ala Cys Leu Ile Gln Asn Phe
 130 135 140

atg cct gag gac atc tcg gtg cag tgg ctg cac aac gag gtg cag ctc 480
 Met Pro Glu Asp Ile Ser Val Gln Trp Leu His Asn Glu Val Gln Leu
 145 150 155 160

ccg gac gcc cgg cac agc acg acg cag ccc cgc aag acc aag ggc tcc 528
 Pro Asp Ala Arg His Ser Thr Thr Gln Pro Arg Lys Thr Lys Gly Ser
 165 170 175

ggc ttc ttc gtc ttc agc cgc ctg gag gtg acc agg gcc gaa tgg gag 576
 Gly Phe Phe Val Phe Ser Arg Leu Glu Val Thr Arg Ala Glu Trp Glu
 180 185 190

cag aaa gat gag ttc atc tgc cgt gca gtc cat gag gca gcg agc ccc 624
 Gln Lys Asp Glu Phe Ile Cys Arg Ala Val His Glu Ala Ala Ser Pro
 195 200 205

tca cag acc gtc cag cga gcg gtg tct gta aat ccc ggt aaa tga 669
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 <213> Homo sapiens

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Arg Pro Ser Pro Phe Asp Leu Phe Ile Arg Lys Ser Pro Thr Ile Thr
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Cys Leu Val Val Asp Leu Ala Pro Ser Lys Gly Thr Val Asn Leu Thr
 35 40 45

Trp Ser Arg Ala Ser Gly Lys Pro Val Asn His Ser Thr Arg Lys Glu
 50 55 60

Glu Lys Gln Arg Asn Gly Thr Leu Thr Val Thr Ser Thr Leu Pro Val
 65 70 75 80

Gly Thr Arg Asp Trp Ile Glu Gly Glu Thr Tyr Gln Cys Arg Val Thr
 85 90 95

His Pro His Leu Pro Arg Ala Leu Met Arg Ser Thr Thr Lys Thr Ser
 100 105 110

Gly Pro Arg Ala Ala Pro Glu Val Tyr Ala Phe Ala Thr Pro Glu Trp
 115 120 125

Pro Gly Ser Arg Asp Lys Arg Thr Leu Ala Cys Leu Ile Gln Asn Phe
 130 135 140

Met Pro Glu Asp Ile Ser Val Gln Trp Leu His Asn Glu Val Gln Leu
 145 150 155 160

Pro Asp Ala Arg His Ser Thr Thr Gln Pro Arg Lys Thr Lys Gly Ser
 165 170 175

Gly Phe Phe Val Phe Ser Arg Leu Glu Val Thr Arg Ala Glu Trp Glu
 180 185 190

Gln Lys Asp Glu Phe Ile Cys Arg Ala Val His Glu Ala Ala Ser Pro
 195 200 205

Ser Gln Thr Val Gln Arg Ala Val Ser Val Asn Pro Gly Lys
 210 215 220

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 <213> Artificial sequence

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 <223> Synthetic Primer

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29

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 <212> DNA
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<220>
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43

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<213> Artificial sequence

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<223> Synthetic Primer

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<210> 7

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<212> DNA

<213> Homo sapiens

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<221> CDS

<222> (1)..(672)

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1 5 10 15

48

agc cgg ccc agc ccg ttc gac ctg ttc atc cgc aag tcg ccc acg atc
Ser Arg Pro Ser Pro Phe Asp Leu Phe Ile Arg Lys Ser Pro Thr Ile
20 25 30

96

acc tgt ctg gtg gtg gac ctg gca ccc agc aag ggg acc gtg cag ctg
Thr Cys Leu Val Val Asp Leu Ala Pro Ser Lys Gly Thr Val Gln Leu
35 40 45

144

acc tgg tcc cgg gcc agt ggg aag cct gtg caa cac tcc acc aga aag
Thr Trp Ser Arg Ala Ser Gly Lys Pro Val Gln His Ser Thr Arg Lys
50 55 60

192

gag gag aag cag cgc aat ggc acg tta acc gtc acg tcc acc ctg ccg
Glu Glu Lys Gln Arg Asn Gly Thr Leu Thr Val Thr Ser Thr Leu Pro
65 70 75 80

240

gtg ggc acc cga gac tgg atc gag ggg gag acc tac cag tgc agg gtg
Val Gly Thr Arg Asp Trp Ile Glu Gly Glu Thr Tyr Gln Cys Arg Val
85 90 95

288

acc cac ccc cac ctg ccc agg gcc ctc atg cgg tcc acg acc aag acc
Thr His Pro His Leu Pro Arg Ala Leu Met Arg Ser Thr Thr Lys Thr
100 105 110

336

agc ggc ccg cgt gct gcc ccg gaa gtc tat gcg ttt gcg acg ccg gag
Ser Gly Pro Arg Ala Ala Pro Glu Val Tyr Ala Phe Ala Thr Pro Glu
115 120 125

384

tgg ccg ggg agc cgg gac aag cgc acc ctc gcc tgc ctg atc cag aac
Trp Pro Gly Ser Arg Asp Lys Arg Thr Leu Ala Cys Leu Ile Gln Asn
130 135 140

432

ttc atg cct gag gac atc tcg gtg cag tgg ctg cac aac gag gtg cag
Phe Met Pro Glu Asp Ile Ser Val Gln Trp Leu His Asn Glu Val Gln
145 150 155 160

480

ctc ccg gac gcc ccg cac agc acg acg cag ccc cgc aag acc aag ggc
Leu Pro Asp Ala Arg His Ser Thr Thr Gln Pro Arg Lys Thr Lys Gly
165 170 175

528

tcc ggc ttc ttc gtc ttc agc cgc ctg gag gtg acc agg gcc gaa tgg 576
 Ser Gly Phe Phe Val Phe Ser Arg Leu Glu Val Thr Arg Ala Glu Trp
 180 185 190

gag cag aaa gat gag ttc atc tgc cgt gca gtc cat gag gca gcg agc 624
 Glu Gln Lys Asp Glu Phe Ile Cys Arg Ala Val His Glu Ala Ala Ser
 195 200 205

ccc tca cag acc gtc cag cga gcg gtg tct gta aat ccc ggt aaa tga 672
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 210 215 220

<210> 8
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 <212> PRT
 <213> Homo sapiens

<400> 8

Ala Asp Pro Cys Ala Asp Ser Asn Pro Arg Gly Val Ser Ala Tyr Leu
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 20 25 30

Thr Cys Leu Val Val Asp Leu Ala Pro Ser Lys Gly Thr Val Gln Leu
 35 40 45

Thr Trp Ser Arg Ala Ser Gly Lys Pro Val Gln His Ser Thr Arg Lys
 50 55 60

Glu Glu Lys Gln Arg Asn Gly Thr Leu Thr Val Thr Ser Thr Leu Pro
 65 70 75 80

Val Gly Thr Arg Asp Trp Ile Glu Gly Glu Thr Tyr Gln Cys Arg Val
 85 90 95

Thr His Pro His Leu Pro Arg Ala Leu Met Arg Ser Thr Thr Lys Thr
 100 105 110

Ser Gly Pro Arg Ala Ala Pro Glu Val Tyr Ala Phe Ala Thr Pro Glu
 115 120 125

Trp Pro Gly Ser Arg Asp Lys Arg Thr Leu Ala Cys Leu Ile Gln Asn
 130 135 140

Phe Met Pro Glu Asp Ile Ser Val Gln Trp Leu His Asn Glu Val Gln
 145 150 155 160

Leu Pro Asp Ala Arg His Ser Thr Thr Gln Pro Arg Lys Thr Lys Gly
 165 170 175

Ser Gly Phe Phe Val Phe Ser Arg Leu Glu Val Thr Arg Ala Glu Trp
 180 185 190

Glu Gln Lys Asp Glu Phe Ile Cys Arg Ala Val His Glu Ala Ala Ser
 195 200 205

Pro Ser Gln Thr Val Gln Arg Ala Val Ser Val Asn Pro Gly Lys
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<210> 9
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 <213> Artificial sequence

<220>
 <223> Synthetic Primer

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 <212> DNA
 <213> Homo sapiens

<220>
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 <222> (1)..(663)

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 agc ccg ttc gac ctg ttc atc cgc aag tgc ccc acg atc acc tgt ctg 96
 Ser Pro Phe Asp Leu Phe Ile Arg Lys Ser Pro Thr Ile Thr Cys Leu
 20 25 30
 gtg gtg gac ctg gca ccc agc aag ggg acc gtg aac ctg acc tgg tcc 144
 Val Val Asp Leu Ala Pro Ser Lys Gly Thr Val Asn Leu Thr Trp Ser
 35 40 45
 cgg gcc agt ggg aag cct gtg aac cac tcc acc aga aag gag gag aag 192
 Arg Ala Ser Gly Lys Pro Val Asn His Ser Thr Arg Lys Glu Glu Lys
 50 55 60
 cag cgc aat ggc acg tta acc gtc acg tcc acc ctg ccg gtg ggc acc 240
 Gln Arg Asn Gly Thr Leu Thr Val Thr Ser Thr Leu Pro Val Gly Thr
 65 70 75 80
 cga gac tgg atc gag ggg gag acc tac cag tgc agg gtg acc cac ccc 288
 Arg Asp Trp Ile Glu Gly Glu Thr Tyr Gln Cys Arg Val Thr His Pro
 85 90 95
 cac ctg ccc agg gcc ctc atg cgg tcc acg acc aag acc agc ggc ccg 336
 His Leu Pro Arg Ala Leu Met Arg Ser Thr Thr Lys Thr Ser Gly Pro
 100 105 110
 cgt gct gcc ccg gaa gtc tat gcg ttt gcg acg ccg gag tgg ccg ggg 384

Arg Ala Ala Pro Glu Val Tyr Ala Phe Ala Thr Pro Glu Trp Pro Gly
 115 120 125

agc cgg gac aag cgc acc ctc gcc tgc ctg atc cag aac ttc atg cct 432
 Ser Arg Asp Lys Arg Thr Leu Ala Cys Leu Ile Gln Asn Phe Met Pro
 130 135 140

gag gac atc tcg gtg cag tgg ctg cac aac gag gtg cag ctc ccg gac 480
 Glu Asp Ile Ser Val Gln Trp Leu His Asn Glu Val Gln Leu Pro Asp
 145 150 155 160

gcc cgg cac agc acg acg cag ccc cgc aag acc aag ggc tcc ggc ttc 528
 Ala Arg His Ser Thr Thr Gln Pro Arg Lys Thr Lys Gly Ser Gly Phe
 165 170 175

ttc gtc ttc agc cgc ctg gag gtg acc agg gcc gaa tgg gag cag aaa 576
 Phe Val Phe Ser Arg Leu Glu Val Thr Arg Ala Glu Trp Glu Gln Lys
 180 185 190

gat gag ttc atc tgc cgt gca gtc cat gag gca gcg agc ccc tca cag 624
 Asp Glu Phe Ile Cys Arg Ala Val His Glu Ala Ala Ser Pro Ser Gln
 195 200 205

acc gtc cag cga gcg gtg tct gta aat ccc ggt aaa tga 663
 Thr Val Gln Arg Ala Val Ser Val Asn Pro Gly Lys
 210 215 220

<210> 11
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 <212> PRT
 <213> Homo sapiens
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Ser Pro Phe Asp Leu Phe Ile Arg Lys Ser Pro Thr Ile Thr Cys Leu
 20 25 30

Val Val Asp Leu Ala Pro Ser Lys Gly Thr Val Asn Leu Thr Trp Ser
 35 40 45

Arg Ala Ser Gly Lys Pro Val Asn His Ser Thr Arg Lys Glu Glu Lys
 50 55 60

Gln Arg Asn Gly Thr Leu Thr Val Thr Ser Thr Leu Pro Val Gly Thr
 65 70 75 80

Arg Asp Trp Ile Glu Gly Glu Thr Tyr Gln Cys Arg Val Thr His Pro
 85 90 95

His Leu Pro Arg Ala Leu Met Arg Ser Thr Thr Lys Thr Ser Gly Pro
 100 105 110

Arg Ala Ala Pro Glu Val Tyr Ala Phe Ala Thr Pro Glu Trp Pro Gly
 Page 7

115 120 125

Ser Arg Asp Lys Arg Thr Leu Ala Cys Leu Ile Gln Asn Phe Met Pro
 130 135 140

Glu Asp Ile Ser Val Gln Trp Leu His Asn Glu Val Gln Leu Pro Asp
 145 150 155 160

Ala Arg His Ser Thr Thr Gln Pro Arg Lys Thr Lys Gly Ser Gly Phe
 165 170 175

Phe Val Phe Ser Arg Leu Glu Val Thr Arg Ala Glu Trp Glu Gln Lys
 180 185 190

Asp Glu Phe Ile Cys Arg Ala Val His Glu Ala Ala Ser Pro Ser Gln
 195 200 205

Thr Val Gln Arg Ala Val Ser Val Asn Pro Gly Lys
 210 215 220

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 <213> Homo sapiens

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 1 5 10 15

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 Ser Pro Phe Asp Leu Phe Ile Arg Lys Ser Pro Thr Ile Thr Cys Leu
 20 25 30

gtg gtg gac ctg gca ccc agc aag ggg acc gtg aac ctg acc tgg tcc 144
 Val Val Asp Leu Ala Pro Ser Lys Gly Thr Val Asn Leu Thr Trp Ser
 35 40 45

cgg gcc agt ggg aag cct gtg aac cac tcc acc aga aag gag gag aag 192
 Arg Ala Ser Gly Lys Pro Val Asn His Ser Thr Arg Lys Glu Glu Lys
 50 55 60

cag cgc aat ggc acg tta acc gtc acg tcc acc ctg ccg gtg ggc acc 240
 Gln Arg Asn Gly Thr Leu Thr Val Thr Ser Thr Leu Pro Val Gly Thr
 65 70 75 80

cga gac tgg atc gag ggg gag acc tac cag tgc agg gtg acc cac ccc 288
 Arg Asp Trp Ile Glu Gly Glu Thr Tyr Gln Cys Arg Val Thr His Pro
 85 90 95

cac ctg ccc agg gcc ctc atg cgg tcc acg acc aag acc agc ggc ccg 336
 His Leu Pro Arg Ala Leu Met Arg Ser Thr Thr Lys Thr Ser Gly Pro

100	105	110	
cgt gct gcc ccg gaa gtc tat gcg ttt gcg acg ccg gag tgg ccg ggg			384
Arg Ala Ala Pro Glu Val Tyr Ala Phe Ala Thr Pro Glu Trp Pro Gly			
115	120	125	
agc cgg gac aag cgc acc ctc gcc tgc ctg atc cag aac ttc atg cct			432
Ser Arg Asp Lys Arg Thr Leu Ala Cys Leu Ile Gln Asn Phe Met Pro			
130	135	140	
gag gac atc tcg gtg cag tgg ctg cac aac gag gtg cag ctc ccg gac			480
Glu Asp Ile Ser Val Gln Trp Leu His Asn Glu Val Gln Leu Pro Asp			
145	150	155	160
gcc cgg cac agc acg acg cag ccc cgc aag acc aag ggc tcc ggc ttc			528
Ala Arg His Ser Thr Thr Gln Pro Arg Lys Thr Lys Gly Ser Gly Phe			
165	170	175	
ttc gtc ttc agc cgc ctg gag gtg acc agg gcc gaa tgg gag cag aaa			576
Phe Val Phe Ser Arg Leu Glu Val Thr Arg Ala Glu Trp Glu Gln Lys			
180	185	190	
gat gag ttc atc tgc cgt gca gtc cat gag gca gcg agc ccc tca cag			624
Asp Glu Phe Ile Cys Arg Ala Val His Glu Ala Ala Ser Pro Ser Gln			
195	200	205	
acc gtc cag cga gcg gtg tct gta aat ccc ggt aaa tga			663
Thr Val Gln Arg Ala Val Ser Val Asn Pro Gly Lys			
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<210> 13
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 <213> Homo sapiens

<400> 13

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20 25 30

Val Val Asp Leu Ala Pro Ser Lys Gly Thr Val Asn Leu Thr Trp Ser
35 40 45

Arg Ala Ser Gly Lys Pro Val Asn His Ser Thr Arg Lys Glu Glu Lys
50 55 60

Gln Arg Asn Gly Thr Leu Thr Val Thr Ser Thr Leu Pro Val Gly Thr
65 70 75 80

Arg Asp Trp Ile Glu Gly Glu Thr Tyr Gln Cys Arg Val Thr His Pro
85 90 95

His Leu Pro Arg Ala Leu Met Arg Ser Thr Thr Lys Thr Ser Gly Pro
100 105 110

Arg Ala Ala Pro Glu Val Tyr Ala Phe Ala Thr Pro Glu Trp Pro Gly
 115 120 125

Ser Arg Asp Lys Arg Thr Leu Ala Cys Leu Ile Gln Asn Phe Met Pro
 130 135 140

Glu Asp Ile Ser Val Gln Trp Leu His Asn Glu Val Gln Leu Pro Asp
 145 150 155 160

Ala Arg His Ser Thr Thr Gln Pro Arg Lys Thr Lys Gly Ser Gly Phe
 165 170 175

Phe Val Phe Ser Arg Leu Glu Val Thr Arg Ala Glu Trp Glu Gln Lys
 180 185 190

Asp Glu Phe Ile Cys Arg Ala Val His Glu Ala Ala Ser Pro Ser Gln
 195 200 205

Thr Val Gln Arg Ala Val Ser Val Asn Pro Gly Lys
 210 215 220

<210> 14
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<220>
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 Ser Pro Phe Asp Leu Phe Ile Arg Lys Ser Pro Thr Ile Thr Cys Leu
 20 25 30
 gtg gtg gac ctg gca ccc agc aag ggg acc gtg aac ctg acc tgg tcc 144
 Val Val Asp Leu Ala Pro Ser Lys Gly Thr Val Asn Leu Thr Trp Ser
 35 40 45
 cgg gcc agt ggg aag cct gtg aac cac tcc acc aga aag gag gag aag 192
 Arg Ala Ser Gly Lys Pro Val Asn His Ser Thr Arg Lys Glu Glu Lys
 50 55 60
 cag cgc aat ggc acg tta acc gtc acg tcc acc ctg ccg gtg ggc acc 240
 Gln Arg Asn Gly Thr Leu Thr Val Thr Ser Thr Leu Pro Val Gly Thr
 65 70 75 80
 cga gac tgg atc gag ggg gag acc tac cag tgc agg gtg acc cac ccc 288
 Arg Asp Trp Ile Glu Gly Glu Thr Tyr Gln Cys Arg Val Thr His Pro
 85 90 95

cac ctg ccc agg gcc ctc atg cgg tcc acg acc aag acc agc ggc ccg 336
 His Leu Pro Arg Ala Leu Met Arg Ser Thr Thr Lys Thr Ser Gly Pro
 100 105 110

cgt gct gcc ccg gaa gtc tat gcg ttt gcg acg ccg gag tgg ccg ggg 384
 Arg Ala Ala Pro Glu Val Tyr Ala Phe Ala Thr Pro Glu Trp Pro Gly
 115 120 125

agc cgg gac aag cgc acc ctc gcc tgc ctg atc cag aac ttc atg cct 432
 Ser Arg Asp Lys Arg Thr Leu Ala Cys Leu Ile Gln Asn Phe Met Pro
 130 135 140

gag gac atc tcg gtg cag tgg ctg cac aac gag gtg cag ctc ccg gac 480
 Glu Asp Ile Ser Val Gln Trp Leu His Asn Glu Val Gln Leu Pro Asp
 145 150 155 160

gcc cgg cac agc acg acg cag ccc cgc aag acc aag ggc tcc ggc ttc 528
 Ala Arg His Ser Thr Thr Gln Pro Arg Lys Thr Lys Gly Ser Gly Phe
 165 170 175

ttc gtc ttc agc cgc ctg gag gtg acc agg gcc gaa tgg gag cag aaa 576
 Phe Val Phe Ser Arg Leu Glu Val Thr Arg Ala Glu Trp Glu Gln Lys
 180 185 190

gat gag ttc atc tgc cgt gca gtc cat gag gca gcg agc ccc tca cag 624
 Asp Glu Phe Ile Cys Arg Ala Val His Glu Ala Ala Ser Pro Ser Gln
 195 200 205

acc gtc cag cga gcg gtg tct gta aat ccc ggt aaa tga 663
 Thr Val Gln Arg Ala Val Ser Val Asn Pro Gly Lys
 210 215 220

<210> 15
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 <212> PRT
 <213> Homo sapiens

<400> 15

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20 25 30

Val Val Asp Leu Ala Pro Ser Lys Gly Thr Val Asn Leu Thr Trp Ser
35 40 45

Arg Ala Ser Gly Lys Pro Val Asn His Ser Thr Arg Lys Glu Glu Lys
50 55 60

Gln Arg Asn Gly Thr Leu Thr Val Thr Ser Thr Leu Pro Val Gly Thr
65 70 75 80

Arg Asp Trp Ile Glu Gly Glu Thr Tyr Gln Cys Arg Val Thr His Pro
85 90 95

His Leu Pro Arg Ala Leu Met Arg Ser Thr Thr Lys Thr Ser Gly Pro
 100 105 110

Arg Ala Ala Pro Glu Val Tyr Ala Phe Ala Thr Pro Glu Trp Pro Gly
 115 120 125

Ser Arg Asp Lys Arg Thr Leu Ala Cys Leu Ile Gln Asn Phe Met Pro
 130 135 140

Glu Asp Ile Ser Val Gln Trp Leu His Asn Glu Val Gln Leu Pro Asp
 145 150 155 160

Ala Arg His Ser Thr Thr Gln Pro Arg Lys Thr Lys Gly Ser Gly Phe
 165 170 175

Phe Val Phe Ser Arg Leu Glu Val Thr Arg Ala Glu Trp Glu Gln Lys
 180 185 190

Asp Glu Phe Ile Cys Arg Ala Val His Glu Ala Ala Ser Pro Ser Gln
 195 200 205

Thr Val Gln Arg Ala Val Ser Val Asn Pro Gly Lys
 210 215 220

<210> 16
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<220>
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<400> 16
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 Ser Pro Phe Asp Leu Phe Ile Arg Lys Ser Pro Thr Ile Thr Cys Leu
 20 25 30

gtg gtg gac ctg gca ccc agc aag ggg acc gtg aac ctg acc tgg tcc 144
 Val Val Asp Leu Ala Pro Ser Lys Gly Thr Val Asn Leu Thr Trp Ser
 35 40 45

cgg gcc agt ggg aag cct gtg aac cac tcc acc aga aag gag gag aag 192
 Arg Ala Ser Gly Lys Pro Val Asn His Ser Thr Arg Lys Glu Glu Lys
 50 55 60

cag cgc aat ggc acg tta acc gtc acg tcc acc ctg ccg gtg ggc acc 240
 Gln Arg Asn Gly Thr Leu Thr Val Thr Ser Thr Leu Pro Val Gly Thr
 65 70 75 80

cga gac tgg atc gag ggg gag acc tac cag tgc agg gtg acc cac ccc 288
 Arg Asp Trp Ile Glu Gly Glu Thr Tyr Gln Cys Arg Val Thr His Pro
 85 90 95

cac ctg ccc agg gcc ctc atg cgg tcc acg acc aag acc agc ggc ccg 336
 His Leu Pro Arg Ala Leu Met Arg Ser Thr Thr Lys Thr Ser Gly Pro
 100 105 110

cgt gct gcc ccg gaa gtc tat gcg ttt gcg acg ccg gag tgg ccg ggg 384
 Arg Ala Ala Pro Glu Val Tyr Ala Phe Ala Thr Pro Glu Trp Pro Gly
 115 120 125

agc cgg gac aag cgc acc ctc gcc tgc ctg atc cag aac ttc atg cct 432
 Ser Arg Asp Lys Arg Thr Leu Ala Cys Leu Ile Gln Asn Phe Met Pro
 130 135 140

gag gac atc tcg gtg cag tgg ctg cac aac gag gtg cag ctc ccg gac 480
 Glu Asp Ile Ser Val Gln Trp Leu His Asn Glu Val Gln Leu Pro Asp
 145 150 155 160

gcc cgg cac agc acg acg cag ccc cgc aag acc aag ggc tcc ggc ttc 528
 Ala Arg His Ser Thr Thr Gln Pro Arg Lys Thr Lys Gly Ser Gly Phe
 165 170 175

ttc gtc ttc agc cgc ctg gag gtg acc agg gcc gaa tgg gag cag aaa 576
 Phe Val Phe Ser Arg Leu Glu Val Thr Arg Ala Glu Trp Glu Gln Lys
 180 185 190

gat gag ttc atc tgc cgt gca gtc cat gag gca gcg agc ccc tca cag 624
 Asp Glu Phe Ile Cys Arg Ala Val His Glu Ala Ala Ser Pro Ser Gln
 195 200 205

acc gtc cag cga gcg gtg tct gta aat ccc ggt aaa tga 663
 Thr Val Gln Arg Ala Val Ser Val Asn Pro Gly Lys
 210 215 220

<210> 17
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 <213> Homo sapiens

<400> 17

Ala Ala Asp Cys Asn Pro Arg Gly Val Ser Ala Tyr Leu Ser Arg Pro
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 20 25 30

Val Val Asp Leu Ala Pro Ser Lys Gly Thr Val Asn Leu Thr Trp Ser
 35 40 45

Arg Ala Ser Gly Lys Pro Val Asn His Ser Thr Arg Lys Glu Glu Lys
 50 55 60

Gln Arg Asn Gly Thr Leu Thr Val Thr Ser Thr Leu Pro Val Gly Thr
 65 70 75 80

Arg Asp Trp Ile Glu Gly Glu Thr Tyr Gln Cys Arg Val Thr His Pro
85 90 95

His Leu Pro Arg Ala Leu Met Arg Ser Thr Thr Lys Thr Ser Gly Pro
100 105 110

Arg Ala Ala Pro Glu Val Tyr Ala Phe Ala Thr Pro Glu Trp Pro Gly
115 120 125

Ser Arg Asp Lys Arg Thr Leu Ala Cys Leu Ile Gln Asn Phe Met Pro
130 135 140

Glu Asp Ile Ser Val Gln Trp Leu His Asn Glu Val Gln Leu Pro Asp
145 150 155 160

Ala Arg His Ser Thr Thr Gln Pro Arg Lys Thr Lys Gly Ser Gly Phe
165 170 175

Phe Val Phe Ser Arg Leu Glu Val Thr Arg Ala Glu Trp Glu Gln Lys
180 185 190

Asp Glu Phe Ile Cys Arg Ala Val His Glu Ala Ala Ser Pro Ser Gln
195 200 205

Thr Val Gln Arg Ala Val Ser Val Asn Pro Gly Lys
210 215 220

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Ser Pro Phe Asp Leu Phe Ile Arg Lys Ser Pro Thr Ile Thr Cys Leu
20 25 30
gtg gtg gac ctg gca ccc agc aag ggg acc gtg aac ctg acc tgg tcc 144
Val Val Asp Leu Ala Pro Ser Lys Gly Thr Val Asn Leu Thr Trp Ser
35 40 45
cgg gcc agt ggg aag cct gtg aac cac tcc acc aga aag gag gag aag 192
Arg Ala Ser Gly Lys Pro Val Asn His Ser Thr Arg Lys Glu Glu Lys
50 55 60
cag cgc aat ggc acg tta acc gtc acg tcc acc ctg ccg gtg ggc acc 240

Gln Arg Asn Gly Thr Leu Thr Val Thr Ser Thr Leu Pro Val Gly Thr
65 70 75 80
cga gac tgg atc gag ggg gag acc tac cag tgc agg gtg acc cac ccc 288
Arg Asp Trp Ile Glu Gly Glu Thr Tyr Gln Cys Arg Val Thr His Pro
85 90 95
cac ctg ccc agg gcc ctc atg cgg tcc acg acc aag acc agc ggc ccg 336
His Leu Pro Arg Ala Leu Met Arg Ser Thr Thr Lys Thr Ser Gly Pro
100 105 110
cgt gct gcc ccg gaa gtc tat gcg ttt gcg acg ccg gag tgg ccg ggg 384
Arg Ala Ala Pro Glu Val Tyr Ala Phe Ala Thr Pro Glu Trp Pro Gly
115 120 125
agc cgg gac aag cgc acc ctc gcc tgc ctg atc cag aac ttc atg cct 432
Ser Arg Asp Lys Arg Thr Leu Ala Cys Leu Ile Gln Asn Phe Met Pro
130 135 140
gag gac atc tcg gtg cag tgg ctg cac aac gag gtg cag ctc ccg gac 480
Glu Asp Ile Ser Val Gln Trp Leu His Asn Glu Val Gln Leu Pro Asp
145 150 155 160
gcc cgg cac agc acg acg cag ccc cgc aag acc aag ggc tcc ggc ttc 528
Ala Arg His Ser Thr Gln Pro Arg Lys Thr Lys Gly Ser Gly Phe
165 170 175
ttc gtc ttc agc cgc ctg gag gtg acc agg gcc gaa tgg gag cag aaa 576
Phe Val Phe Ser Arg Leu Glu Val Thr Arg Ala Glu Trp Glu Gln Lys
180 185 190
gat gag ttc atc tgc cgt gca gtc cat gag gca gcg agc ccc tca cag 624
Asp Glu Phe Ile Cys Arg Ala Val His Glu Ala Ala Ser Pro Ser Gln
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Thr Val Gln Arg Ala Val Ser Val Asn Pro Gly Lys
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35 40 45

Arg Ala Ser Gly Lys Pro Val Asn His Ser Thr Arg Lys Glu Glu Lys
50 55 60

Gln Arg Asn Gly Thr Leu Thr Val Thr Ser Thr Leu Pro Val Gly Thr

65 70 75 80

Arg Asp Trp Ile Glu Gly Glu Thr Tyr Gln Cys Arg Val Thr His Pro
85 90 95

His Leu Pro Arg Ala Leu Met Arg Ser Thr Thr Lys Thr Ser Gly Pro
100 105 110

Arg Ala Ala Pro Glu Val Tyr Ala Phe Ala Thr Pro Glu Trp Pro Gly
115 120 125

Ser Arg Asp Lys Arg Thr Leu Ala Cys Leu Ile Gln Asn Phe Met Pro
130 135 140

Glu Asp Ile Ser Val Gln Trp Leu His Asn Glu Val Gln Leu Pro Asp
145 150 155 160

Ala Arg His Ser Thr Thr Gln Pro Arg Lys Thr Lys Gly Ser Gly Phe
165 170 175

Phe Val Phe Ser Arg Leu Glu Val Thr Arg Ala Glu Trp Glu Gln Lys
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Asp Glu Phe Ile Cys Arg Ala Val His Glu Ala Ala Ser Pro Ser Gln
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Ser Pro Phe Asp Leu Phe Ile Arg Lys Ser Pro Thr Ile Thr Cys Leu
20 25 30
gtg gtg gac ctg gca ccc agc aag ggg acc gtg aac ctg acc tgg tcc
Val Val Asp Leu Ala Pro Ser Lys Gly Thr Val Asn Leu Thr Trp Ser
35 40 45
cgg gcc agt ggg aag cct gtg aac cac tcc acc aga aag gag gag aag
Arg Ala Ser Gly Lys Pro Val Asn His Ser Thr Arg Lys Glu Glu Lys

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Arg Ala Ser Gly Lys Pro Val Asn His Ser Thr Arg Lys Glu Glu Lys
50 55 60

Page 18

cgg gcc agt ggg aag cct gtg aac cac tcc acc aga aag gag gag aag 192
 Arg Ala Ser Gly Lys Pro Val Asn His Ser Thr Arg Lys Glu Glu Lys
 50 55 60

cag cgc aat ggc acg tta acc gtc acg tcc acc ctg ccg gtg ggc acc 240
 Gln Arg Asn Gly Thr Leu Thr Val Thr Ser Thr Leu Pro Val Gly Thr
 65 70 75 80

cga gac tgg atc gag ggg gag acc tac cag tgc agg gtg acc cac ccc 288
 Arg Asp Trp Ile Glu Gly Glu Thr Tyr Gln Cys Arg Val Thr His Pro
 85 90 95

cac ctg ccc agg gcc ctc atg cgg tcc acg acc aag acc agc ggc ccg 336
 His Leu Pro Arg Ala Leu Met Arg Ser Thr Thr Lys Thr Ser Gly Pro
 100 105 110

cgt gct gcc ccg gaa gtc tat gcg ttt gcg acg ccg gag tgg ccg ggg 384
 Arg Ala Ala Pro Glu Val Tyr Ala Phe Ala Thr Pro Glu Trp Pro Gly
 115 120 125

agc cgg gac aag cgc acc ctc gcc tgc ctg atc cag aac ttc atg cct 432
 Ser Arg Asp Lys Arg Thr Leu Ala Cys Leu Ile Gln Asn Phe Met Pro
 130 135 140

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 Glu Asp Ile Ser Val Gln Trp Leu His Asn Glu Val Gln Leu Pro Asp
 145 150 155 160

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 165 170 175

ttc gtc ttc agc cgc ctg gag gtg acc agg gcc gaa tgg gag cag aaa 576
 Phe Val Phe Ser Arg Leu Glu Val Thr Arg Ala Glu Trp Glu Gln Lys
 180 185 190

gat gag ttc atc tgc cgt gca gtc cat gag gca gcg agc ccc tca cag 624
 Asp Glu Phe Ile Cys Arg Ala Val His Glu Ala Ala Ser Pro Ser Gln
 195 200 205

acc gtc cag cga gcg gtg tct gta aat ccc ggt aaa tga 663
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 35 40 45

Arg Ala Ser Gly Lys Pro Val Asn His Ser Thr Arg Lys Glu Glu Lys
50 55 60

Gln Arg Asn Gly Thr Leu Thr Val Thr Ser Thr Leu Pro Val Gly Thr
65 70 75 80

Arg Asp Trp Ile Glu Gly Glu Thr Tyr Gln Cys Arg Val Thr His Pro
85 90 95

His Leu Pro Arg Ala Leu Met Arg Ser Thr Thr Lys Thr Ser Gly Pro
100 105 110

Arg Ala Ala Pro Glu Val Tyr Ala Phe Ala Thr Pro Glu Trp Pro Gly
115 120 125

Ser Arg Asp Lys Arg Thr Leu Ala Cys Leu Ile Gln Asn Phe Met Pro
130 135 140

Glu Asp Ile Ser Val Gln Trp Leu His Asn Glu Val Gln Leu Pro Asp
145 150 155 160

Ala Arg His Ser Thr Thr Gln Pro Arg Lys Thr Lys Gly Ser Gly Phe
165 170 175

Phe Val Phe Ser Arg Leu Glu Val Thr Arg Ala Glu Trp Glu Gln Lys
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Ser Pro Phe Asp Leu Phe Ile Arg Lys Ser Pro Thr Ile Thr Cys Leu
20 25 30

gtg gtg gac ctg gca ccc agc aag ggg acc gtg aac ctg acc tgg tcc 144
Val Val Asp Leu Ala Pro Ser Lys Gly Thr Val Asn Leu Thr Trp Ser
35 40 45

cgg gcc agt ggg aag cct gtg aac cac tcc acc aga aag gag gag aag 192
Arg Ala Ser Gly Lys Pro Val Asn His Ser Thr Arg Lys Glu Glu Lys
50 55 60

cag cgc aat ggc acg tta acc gtc acg tcc acc ctg cgg gtg ggc acc 240
Gln Arg Asn Gly Thr Leu Thr Val Thr Ser Thr Leu Pro Val Gly Thr
65 70 75 80

cga gac tgg atc gag ggg gag acc tac cag tgc agg gtg acc cac ccc 288
Arg Asp Trp Ile Glu Gly Glu Thr Tyr Gln Cys Arg Val Thr His Pro
85 90 95

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His Leu Pro Arg Ala Leu Met Arg Ser Thr Thr Lys Thr Ser Gly Pro
100 105 110

cgt gct gcc ccg gaa gtc tat gcg ttt gcg acg ccg gag tgg ccg ggg 384
Arg Ala Ala Pro Glu Val Tyr Ala Phe Ala Thr Pro Glu Trp Pro Gly
115 120 125

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Ser Arg Asp Lys Arg Thr Leu Ala Cys Leu Ile Gln Asn Phe Met Pro
130 135 140

gag gac atc tcg gtg cag tgg ctg cac aac gag gtg cag ctc ccg gac 480
Glu Asp Ile Ser Val Gln Trp Leu His Asn Glu Val Gln Leu Pro Asp
145 150 155 160

gcc cgg cac agc acg acg cag ccc cgc aag acc aag ggc tcc ggc ttc 528
Ala Arg His Ser Thr Thr Gln Pro Arg Lys Thr Lys Gly Ser Gly Phe
165 170 175

ttc gtc ttc agc cgc ctg gag gtg acc agg gcc gaa tgg gag cag aaa 576
Phe Val Phe Ser Arg Leu Glu Val Thr Arg Ala Glu Trp Glu Gln Lys
180 185 190

gat gag ttc atc tgc cgt gca gtc cat gag gca gcg agc ccc tca cag 624
Asp Glu Phe Ile Cys Arg Ala Val His Glu Ala Ala Ser Pro Ser Gln
195 200 205

acc gtc cag cga gcg gtg tct gta aat ccc ggt aaa tga 663
Thr Val Gln Arg Ala Val Ser Val Asn Pro Gly Lys
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20 25 30

Val Val Asp Leu Ala Pro Ser Lys Gly Thr Val Asn Leu Thr Trp Ser
 35 40 45

Arg Ala Ser Gly Lys Pro Val Asn His Ser Thr Arg Lys Glu Glu Lys
 50 55 60

Gln Arg Asn Gly Thr Leu Thr Val Thr Ser Thr Leu Pro Val Gly Thr
 65 70 75 80

Arg Asp Trp Ile Glu Gly Glu Thr Tyr Gln Cys Arg Val Thr His Pro
 85 90 95

His Leu Pro Arg Ala Leu Met Arg Ser Thr Thr Lys Thr Ser Gly Pro
 100 105 110

Arg Ala Ala Pro Glu Val Tyr Ala Phe Ala Thr Pro Glu Trp Pro Gly
 115 120 125

Ser Arg Asp Lys Arg Thr Leu Ala Cys Leu Ile Gln Asn Phe Met Pro
 130 135 140

Glu Asp Ile Ser Val Gln Trp Leu His Asn Glu Val Gln Leu Pro Asp
 145 150 155 160

Ala Arg His Ser Thr Thr Gln Pro Arg Lys Thr Lys Gly Ser Gly Phe
 165 170 175

Phe Val Phe Ser Arg Leu Glu Val Thr Arg Ala Glu Trp Glu Gln Lys
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Asp Glu Phe Ile Cys Arg Ala Val His Glu Ala Ala Ser Pro Ser Gln
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Thr Val Gln Arg Ala Val Ser Val Asn Pro Gly Lys
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 1 5 10 15

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Ser Pro Phe Asp Leu Phe Ile Arg Lys Ser Pro Thr Ile Thr Cys Leu
 20 25 30
 gtg gtg gac ctg gca ccc agc aag ggg acc gtg aac ctg acc tgg tcc 144
 Val Val Asp Leu Ala Pro Ser Lys Gly Thr Val Asn Leu Thr Trp Ser
 35 40 45
 cgg gcc agt ggg aag cct gtg aac cac tcc acc aga aag gag gag aag 192
 Arg Ala Ser Gly Lys Pro Val Asn His Ser Thr Arg Lys Glu Glu Lys
 50 55 60
 cag cgc aat ggc acg tta acc gtc acg tcc acc ctg ccg gtg ggc acc 240
 Gln Arg Asn Gly Thr Leu Thr Val Thr Ser Thr Leu Pro Val Gly Thr
 65 70 75 80
 cga gac tgg atc gag ggg gag acc tac cag tgc agg gtg acc cac ccc 288
 Arg Asp Trp Ile Glu Gly Glu Thr Tyr Gln Cys Arg Val Thr His Pro
 85 90 95
 cac ctg ccc agg gcc ctc atg cgg tcc acg acc aag acc agc ggc ccg 336
 His Leu Pro Arg Ala Leu Met Arg Ser Thr Thr Lys Thr Ser Gly Pro
 100 105 110
 cgt gct gcc ccg gaa gtc tat gcg ttt gcg acg ccg gag tgg ccg ggg 384
 Arg Ala Ala Pro Glu Val Tyr Ala Phe Ala Thr Pro Glu Trp Pro Gly
 115 120 125
 agc cgg gac aag cgc acc ctc gcc tgc ctg atc cag aac ttc atg cct 432
 Ser Arg Asp Lys Arg Thr Leu Ala Cys Leu Ile Gln Asn Phe Met Pro
 130 135 140
 gag gac atc tgc gtg cag tgg ctg cac aac gag gtg cag ctc ccg gac 480
 Glu Asp Ile Ser Val Gln Trp Leu His Asn Glu Val Gln Leu Pro Asp
 145 150 155 160
 gcc cgg cac agc acg acg cag ccc cgc aag acc aag ggc tcc ggc ttc 528
 Ala Arg His Ser Thr Thr Gln Pro Arg Lys Thr Lys Gly Ser Gly Phe
 165 170 175
 ttc gtc ttc agc cgc ctg gag gtg acc agg gcc gaa tgg gag cag aaa 576
 Phe Val Phe Ser Arg Leu Glu Val Thr Arg Ala Glu Trp Glu Gln Lys
 180 185 190
 gat gag ttc atc tgc cgt gca gtc cat gag gca gcg agc ccc tca cag 624
 Asp Glu Phe Ile Cys Arg Ala Val His Glu Ala Ala Ser Pro Ser Gln
 195 200 205
 acc gtc cag cga gcg gtg tct gta aat ccc ggt aaa tga 663
 Thr Val Gln Arg Ala Val Ser Val Asn Pro Gly Lys
 210 215 220

<210> 27
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 <213> Homo sapiens
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35	40	45
Arg Ala Ser Gly Lys Pro Val Asn His Ser Thr Arg Lys Glu Glu Lys		
50	55	60
Gln Arg Asn Gly Thr Leu Thr Val Thr Ser Thr Leu Pro Val Gly Thr		
65	70	75
Arg Asp Trp Ile Glu Gly Glu Thr Tyr Gln Cys Arg Val Thr His Pro		
85	90	95
His Leu Pro Arg Ala Leu Met Arg Ser Thr Thr Lys Thr Ser Gly Pro		
100	105	110
Arg Ala Ala Pro Glu Val Tyr Ala Phe Ala Thr Pro Glu Trp Pro Gly		
115	120	125
Ser Arg Asp Lys Arg Thr Leu Ala Cys Leu Ile Gln Asn Phe Met Pro		
130	135	140
Glu Asp Ile Ser Val Gln Trp Leu His Asn Glu Val Gln Leu Pro Asp		
145	150	155
Ala Arg His Ser Thr Thr Gln Pro Arg Lys Thr Lys Gly Ser Gly Phe		
165	170	175
Phe Val Phe Ser Arg Leu Glu Val Thr Arg Ala Glu Trp Glu Gln Lys		
180	185	190
Asp Glu Phe Ile Cys Arg Ala Val His Glu Ala Ala Ser Pro Ser Gln		
195	200	205
Thr Val Gln Arg Ala Val Ser Val Asn Pro Gly Lys		
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<210> 29
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<400> 29

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 1 5 10

<210> 30
 <211> 44
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 1 5 10

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<220>
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<222> (2)..(40)

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1 5 10

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1 5 10

<210> 35
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<213> Artificial

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1 5 10

<210> 36
<211> 42
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<220>
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<222> (2)..(40)

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 1 5 10

42

<210> 37

<211> 13

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<400> 37

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 1 5 10

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 1 5 10

42

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1 5 10

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1 5 10

<210> 42
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1 5 10

<210> 43
<211> 13
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<400> 43
Arg Ala Asp Pro Ala Ala Asp Ser Asn Cys Arg Gly Val
1 5 10

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<222> (2)..(40)

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<223> Synthetic Primer

<400> 49

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